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The emerging problem of water supply may be a critical factor in the future location of industry and population.

What About Water?

R. L. McNamee

WE see water over, on, and in the earth as it courses its way through the hydrologic cycle—rainfall, transpiration, evaporation, runoff, and infiltration. "All the rivers run into the sea, yet the sea is not full; unto the place from whence the rivers come, thither they return again."—Ecclesiastes 1:7

Our Primary Supplies of Water

In the United States we receive about 30 inches depth of precipitation each year. About 11 inches is transpired by plants and about 11 inches is evaporated from the ground surface and from water surfaces. About 8 inches runs off over the ground surface or filters under ground. There isn't a great deal that man can do about the 22 inches returned to the clouds by transpiration and evaporation. About all that man can affect by his use or abuse is the 8 inches of runoff and underflow. This is the component from which we draw our water supplies for domestic, industrial, and agricultural use, and extract our water power, on which we sail our ships, and in which we dilute our wastes.

The indestructibility of water is the primary factor in the maintenance of life on this planet. Water on the earth today is the same water that existed when the earth was born billions of years ago, though passing through many phases countless times. Though polluted by wastes and contaminated by dissolved salts until it is undrinkable and brackish, it is continually being cleansed and freshened by natural evaporation into the atmosphere. But, of the earth's total water, less than 5 per cent is in transit of the hydrologic cycle, more than 95 per cent being held in the oceans and the polar ice caps, practically useless to man.

The gathering of water has always been an impelling factor in the progress of man in his migrations over the face of the globe. When, because the land became too crowded for their families and flocks, Abraham and Lot found it necessary to separate, Lot selected the plain of Jordan "because it was well watered everywhere." Roman wells are found in every country conquered by the Romans. Rome itself was first supplied by the Aqua Appia, 11 miles long, built in 312 B.C. Herculaneum, buried by the ashes of Vesuvius in 79 A.D., was discovered in 1711 by an Italian peasant while digging a well. The subsequent excavation of the buried city disclosed one of its public wells, which, surrounded by a curb and covered with an arched roof, was not filled by ashes and lava, but still held a good supply of water.

I, myself had something of a thrill, when, in connection with the provision of a water supply for American troops in Germany, we utilized a lead-jointed clay pipe line said to date from Caesar's campaign along the Rhine.

Today, we collect our water supplies from three horizons: the atmosphere, the ground surface, and underground.

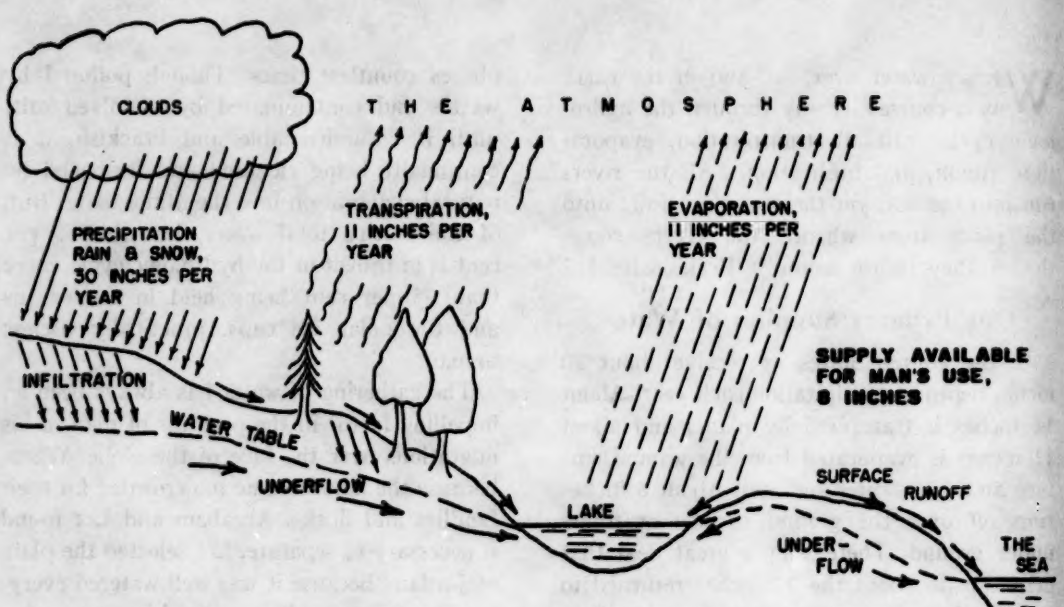
About the author—

Mr. McNamee is a graduate of the University of Michigan (B.S.E. 1917 and C.E. 1930). He has been associated with the firm of Drury, McNamee, and Porter since 1919, following a period of military service. At present he is Chairman of the Committee on Filtration of the American Waterworks Association.

Collection directly from the air is practised on a large scale only where surface and underground sources are unavailable or impractical. Typical examples are the systems at Gibraltar and Bermuda and other small islands. Suitable catchment areas are paved as watersheds, protected from pollution, and drained to storage reservoirs from which supplies are drawn.

Water from the sea supplies some industrial uses, principally in the states of Connecticut, Maryland, New Jersey, New York, and Texas. It is, of course, brackish and utterly unacceptable for many uses of water.

Supplies for rural and suburban areas and for villages and small towns are usually drawn from the ground by wells. These wells may



GENERALIZED WATER BALANCE OF THE UNITED STATES

Waters from such watersheds are naturally clear and soft.

Surface sources provide most of the large water supplies, probably about 75 per cent of the demands of cities and towns and over 90 per cent of the demands of industries. In the well-watered Midwest of this country, many municipalities and industries draw supplies from the run of the rivers or from the Great Lakes, but in those cases where large cities or industries must use small streams, impounding dams and reservoirs are utilized.

Water from surface sources in the glaciated regions of the Midwest is moderately hard, turbid after heavy rainfalls, and usually carries some bacterial pollution.

draw from glacial till above the bed rock or may tap the deeper supplies from within the rock itself.

Water from underground sources is mineralized by solution of the ground structure through which it passes. Ground waters are usually clear, hard, and free of bacterial contamination, but may contain iron, manganese, and other staining elements.

Our Demands for Water

With the enormous supplies of water that are apparent, it is a matter of surprise, and, in the minds of some people, even doubt that there is any real deficiency in supply to fulfill our demands. But, today some 40 million

Americans—about one quarter of our total population—are face to face with water problems of either quantity or quality. And, the serious aspect of the problem is that the demands are increasing at a more rapid rate than population growth, while, of course, the primary supply is unchanging.

There is no basic material more widely used or having more varied applications than water. Some seven major uses or functions are served.

Probably the most essential use of water is for the support of life, both animal and vegetable. Ancient cities have long since disappeared, in many cases due to a lack of water supply. Mesa Verde in our own West is an example of a site that a population deserted because of failure of its water supply. Our use of water for domestic purposes is at a rate of about 50 gallons per capita per day. The demand for agricultural crops is at a rate of about four inches of depth per month during the growing season.

As an ingredient, water becomes a component of many of the products of our civilization. It enters most of our foods and many of our basic construction materials. A cubic yard of concrete incorporates 25 to 35 gallons of water. Bread involves 0.5 gallon per pound or 1,000 gallons per ton.

Water is a most useful industrial tool. In the placer mine of the early west, water erosion was employed to get at the gold-bearing sands and gravels. Flotation and sedimentation of water-borne ores are the basis of the refining processes of some minerals. One of the seemingly incongruous applications of water as a tool is in the scarfing of steel in rolling mills. While the white-hot slabs of steel are passing the first rolls, water at a pressure of 1,000 pounds per square inch is jetted in a knife-like sheet to remove the mill scale. It requires about 65,000 gallons of water to make a ton of finished steel.

As a cleanser, water is employed in almost every product industry. About 10,000 gallons of water are used with each ton of laundry work. Cotton bleaching requires about 70,000 gallons per ton produced.

The uses of water as a heat transfer agent are common. We heat and cool our homes and places of business and recreation. We apply heat or remove heat in our industrial processes using water as the agent. It requires about 50,000 gallons of water to cool an aircraft engine under test. A ton of rubber production involves about 600,000 gallons of water. The installed pumping capacity in just one of the several plants involved with the construction of the atomic bomb would be adequate to serve a city the size of Chicago.

Water is employed as a vehicle in the handling of materials. Fruits and vegetables are conveyed into and through our processing plants by water carriage. Dry kraft paper pulp requires some 90,000 gallons of water per ton. About 200,000 gallons are used to produce a ton of viscose rayon yarn.

As a solvent, water finds many uses. Common salt is mined by pumping water down to the salt beds, where the salt is dissolved and pumped back to the surface as a brine. Some 5 million gallons are involved in the production of a ton of bromine.

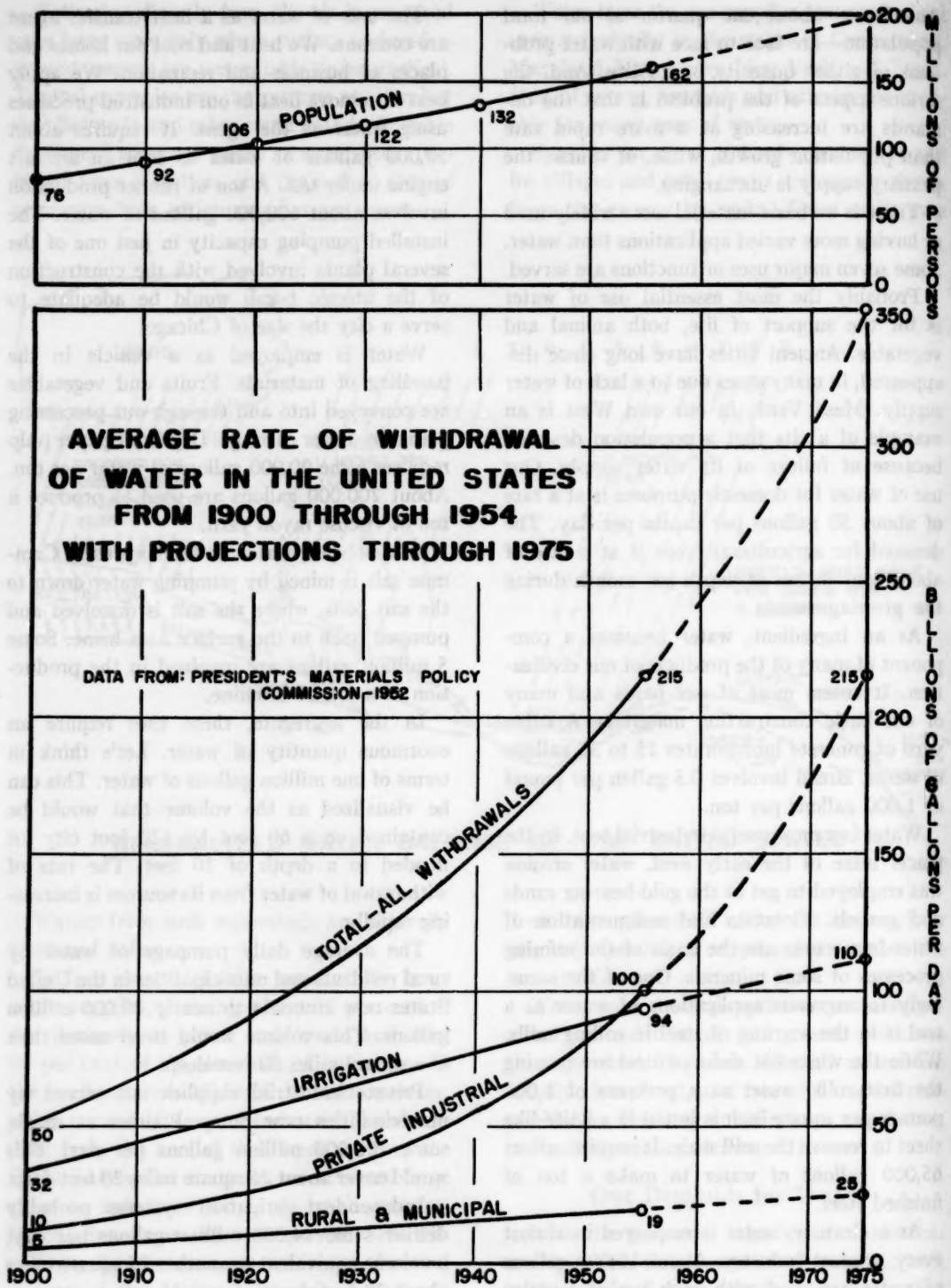
In the aggregate, these uses require an enormous quantity of water. Let's think in terms of one million gallons of water. This can be visualized as the volume that would be contained on a 60 foot by 120 foot city lot flooded to a depth of 20 feet. The rate of withdrawal of water from its sources is increasing rapidly.

The average daily pumpage of water by rural residents and municipalities in the United States now amounts to nearly 20,000 million gallons. This volume would cover more than five square miles 20 feet deep.

Private industrial supplies not served by municipalities now pump 5 times as much, some 100,000 million gallons per day. This would cover about 26 square miles 20 feet deep.

Independent irrigation systems probably deliver some 94,000 million gallons per day, a volume equivalent to another 25 square miles about 20 feet deep.

The total of all these consumptive uses now amounts to 215,000 million gallons per day,


AVERAGE RATE OF WITHDRAWAL
OF WATER IN THE UNITED STATES
FROM 1900 THROUGH 1954
WITH PROJECTIONS THROUGH 1975
DATA FROM: PRESIDENT'S MATERIALS POLICY COMMISSION-1952
POPULATION
76
92
106
122
132
162
200
150
100
50
0
MILLIONS OF PERSONS
350
300
250
200
150
100
50
0
BILLIONS OF GALLONS PER DAY
TOTAL-ALL WITHDRAWALS
215
215
IRRIGATION
100
110
94
PRIVATE INDUSTRIAL
50
32
RURAL & MUNICIPAL
10
5
19
25
1900
1910
1920
1930
1940
1950
1960
1970
1975

which is about 1,300 gallons per day for each of the 162,000,000 persons in the country, and equivalent to an average depth of about 1.5 inches per year over the U.S.A.

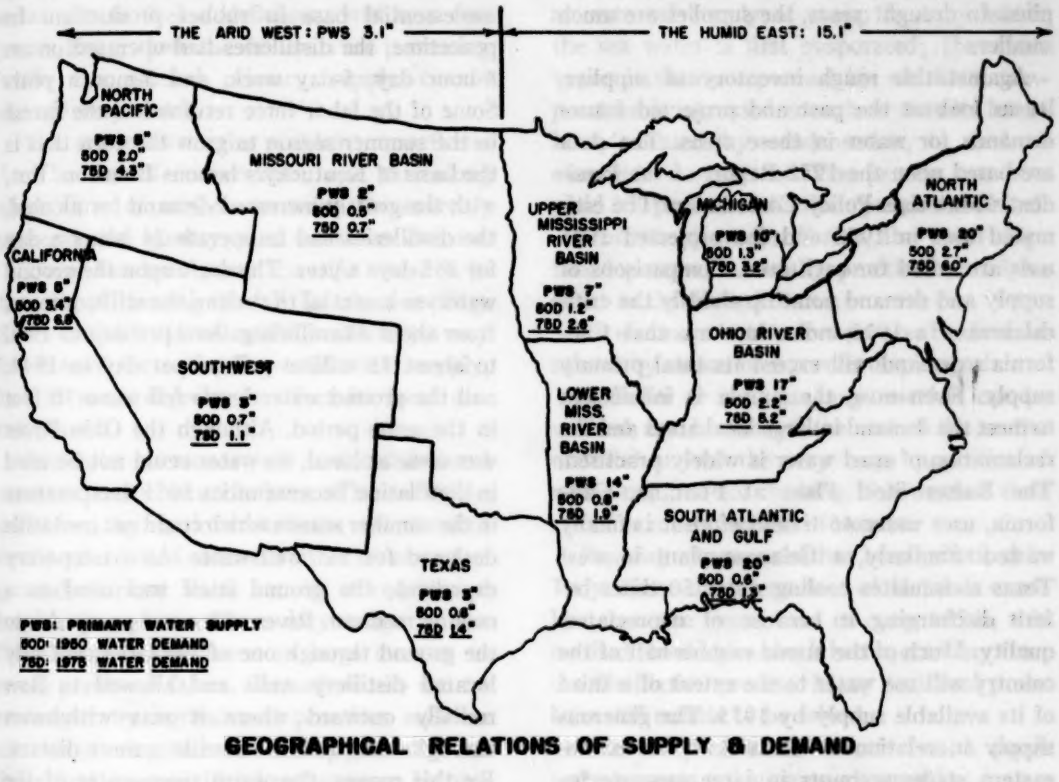
It has been estimated by the President's Materials Policy Commission that in 1975 our withdrawals for rural and municipal use will amount to about 25 billion gallons per day; private industrial supplies, about 215 billion gallons per day; irrigation, about 110 billion gallons per day; totaling 350 billion gallons per day. By that date our population will have enlarged to 200 million persons, and our water withdrawal will be at the rate of 1,750 gallons per capita per day, equivalent to an average depth of 2.5 inches per year over the U. S. A.

Geographical Relations of Supply and Demand

It would seem that there should be no serious water problem when we have, after precipitation, evaporation, and transpiration, a residual primary supply of about 8 inches of depth over the continental United States, to meet a 1955 demand averaging a little over 1.5 inches of depth, or even to meet a probable 1975 demand averaging 2.5 inches of depth over the same area. And there wouldn't be any problem if the demands were co-extensive with the supply. But such is not the case. The problem is one of distribution.

The 17 western states (lying west of Minnesota, Iowa, Missouri, Arkansas, and Louisiana) are now using about 1.1 inches of the 3.1 inches of primary supply they have; the 31 eastern states are now using about 1.3 inches of the 15.1 inches of the primary supply available to them.

On the above map the country is divided along state lines into areas, each of which is roughly homogeneous with respect to both the available supply and the principal uses of water. The available supply in inches of depth over each area is indicated as PWS



GEOGRAPHICAL RELATIONS OF SUPPLY & DEMAND

On the above map the country is divided along state lines into areas, each of which is roughly homogeneous with respect to both the available supply and the principal uses of water. The available supply in inches of depth over each area is indicated as PWS

(Potential Water Supply). These resources amount to 20-inch depth in the Atlantic and Eastern Gulf states, 7 to 17 inches in the East Central states, 5 inches in the Pacific Coast states, and 2 to 3 inches in the West Central and South West states. The eastern seaboard has ten times as much available supply per unit of area as have some of the plains states. The zone from west Texas to southern California has an available supply of less than one inch of depth. These figures are average supplies. In drought years, the supplies are much smaller.

Against this rough inventory of supplies, let us look at the past and projected future demands for water in these areas. The data are based upon the 1952 Report of the President's Materials Policy Commission. The estimated uses in 1950 and the projected 1975 uses are noted for each area. Comparisons of supply and demand point up sharply the critical areas. In 1975 indications are that California's demand will exceed its total primary supply. Even now, the supply is insufficient to meet the demand in large local areas and the reclamation of used water is widely practised. The Kaiser Steel Plant at Fontana, California, uses water 46 times before it is finally wasted. Similarly, a Celanese plant in west Texas recirculates cooling water 50 times before discharging it because of depreciated quality. Much of the humid eastern half of the country will use water to the extent of a third of its available supply by 1975. The generous supply in relation to demand in the southeastern states accounts in large measure for the recent growth of industry in that area.

The Houston-Galveston-Texas City area has long suffered a water shortage through dependence upon a ground water supply. While the population has more than tripled in the last 20 years, the ground water table has dropped as much as 150 feet. A river supply is now being tapped.

The Los Angeles-San Diego area of Southern California already receives much of its supply from the Colorado River, and fears that it may lose some of this to cities and states along the river itself. Studies are underway seeking a supply from the Feather River basin north of Sacramento. Consideration is also being given to desalting sea water.

The Louisville, Kentucky area had one of the most critical water supply problems engendered by World War II. This area was selected as the location for the development of the synthetic rubber industry, principally because of the distilleries that could be converted to the production of industrial alcohol, an essential base in rubber production. In peacetime, the distilleries had operated on an 8-hour day, 5-day week, and 5-month year. Some of the labor force returned to the farms in the summer season to grow the corn that is the basis of Kentucky's famous Bourbon. But, with the greatly increased demand for alcohol, the distilleries had to operate 24 hours a day for 365 days a year. The draft upon the ground water, so essential to cooling the stills, jumped from about 37 million gallons per day in 1940 to about 75 million gallons per day in 1944, and the ground water levels fell some 70 feet in the same period. Although the Ohio River was close at hand, its water could not be used in distillation because of its 80°F temperature in the summer season which could not cool stills designed for 55° well water. As a temporary expedient, the ground itself was used as a cooling medium. River water was pumped into the ground through one of the large centrally located distillery wells and allowed to flow radially outward where it was withdrawn through other wells a half mile or more distant. By this means, the warm river water of the summer season was brought down to a usable temperature for a couple of years. However, the ground itself became so warmed that as a cooling agent, it would not have been effective had the war demand upon it lasted much longer.

The Mahoning River at Youngstown, Ohio, is a more aggravated example of a temperature condition. At Youngstown, the average flow in the river is about 120 million gallons per day. Between Youngstown and Lowellville, a distance of about 10 miles, industry uses some

1,200 million gallons per day of river water for cooling purposes. As a result of the use and reuse of the river 10 times, the temperature of the river water at Lowellville sometimes rises to 140°F even in the winter.

What Must We Do About Water?

The evidence is quite persuasive that some large sections of the country, and many local points in otherwise well-watered sections are now suffering water shortages; and that other areas are to feel a deficiency within a few years. Everywhere the demands are increasing while the natural primary supply cannot change very much.

The approach to the problem must therefore be one of conservation, and this along three lines of action: conserve the sources; conserve the quality; and conserve the use.

There has been some scientific research in the stimulation of rainfall by cloud-seeding. Such methods, if successful, cannot go very far toward increasing the total water supply, but in some degree can affect its local distribution.

Our water sources are our surface lakes and streams and the underflows. These can be conserved by various methods, all directed to the retardation of runoff either on or underground. Surface water can be stored behind impounding dams. These may range in size from massive structures on large streams to small ponds on farms. Ground waters can be recharged by agricultural practices such as contour plowing and maintaining ground cover. In critical cases, artificial recharge can be promoted by water spreading over prepared infiltration fields.

In some areas and circumstances, water now lost through unnecessary or excessive drainage can be conserved by elimination or reduction of the drainage.

Much water can be saved or reclaimed through conservation of its quality. The treatment of sewage or industrial waste waters before their discharge into lakes and streams renders them more acceptable for the service of a downstream user. In many cases treated waste water of an industry can be reused by that industry instead of making additional withdrawals from natural sources. Such practice offers one of the greatest opportunities for water conservation.

The conversion of sea water to fresh water is the subject of extensive research at the present time. Some seven methods are under study.

The compression distillation process developed for the Navy in World War II employs an external supply of steam heat by which the sea water is first evaporated; the water vapor is then compressed by which its temperature is increased enough so that its latent heat, released by condensation, is used to evaporate more water. The process can now yield 200 pounds of distillate per pound of fuel.

Multiple effect distillation, the usual shipboard process, is usually practiced as triple-effect in the United States.

An electrolytic process separates the ionized solutes by means of a porous diaphragm.

A zeolite or ionic exchange method can be utilized, but because of the cost of the zeolite material and of the very large quantities of water required for flushing, this method does not offer much promise of success.

Freezing of sea water has been practiced in Italy. Since the latent heat of fusion is much less than the latent heat of evaporation, this method should give much better economy than the distillation process. Many technical problems still remain to be solved.

Solar evaporation is effective on a small scale in areas enjoying much sunshine.

A thermal-difference power plant is designed to operate in the tropics by the condensation of the vapor of warm sea water on the ocean surface by cold sea water from great depths.

The practice of conservation in the use of water will have the greatest effect in restoring and maintaining a favorable balance of supply over demand, simply because man has more means of control over demand than over supply.

The elimination of waste will go far toward reducing our apparent demands for water. It

is estimated that the loss of water through leaking mains and dripping faucets and valves in New York City alone amounts to about 200 million gallons per day. This is about half of the average daily pumpage of the City of Detroit. It is considerably greater than the average aggregate pumpage of the next ten Michigan cities of Flint, Grand Rapids, Dearborn, Lansing, Saginaw, Pontiac, Jackson, Kalamazoo, Bay City, and Ann Arbor.

Our available supply of water can be extended over our demands upon it by water salvage. Much of the large volumes used in cooling processes is qualitatively changed only in temperature and can be subsequently used in other ways. The cases of the plants using their water supply up to 50 times before finally discarding it have been cited. Many similar opportunities exist in the industrial field, of which advantage has not been taken as yet.

A number of the uses of water involving very large volumes can be supplied by alternate means, thus eliminating or reducing the demands for water. Cooling processes, in particular, can be served as well and sometimes better by refrigeration, by recirculation of water through cooling towers, and other means, instead of by one-pass circulation of naturally cool waters and their subsequent wastage. In some southern cities, the 15 to 20 per cent of the total water supply now used only for air-conditioning could be replaced by mechanical refrigeration.

Our problems of water supply and demand are very real and foreboding and need our serious attention. Their solutions, like those of most of our problems, generally come about under economic pressure and so, even though we are able to evaluate our worsening situation, we will remedy it only when and as we are impelled to do it by the immediate circumstances.

Kipling's British soldier had it sized up about right:

"You may talk o' gin and beer
When you're quartered safe out here
An' you're sent to penny-fights and
Aldershot it;
But when it comes to slaughter,
You will do your work on water
An' you'll lick the bloomin' boots of 'im
that got it."

A modern paraphrase might read:

There is many a liquid resource
To which mankind now has recourse
When his need with any product is to
wet it;
But as a cleanser, cooler, hotter,
There is nothing quite like water
And he'll go to almost any length to get it.

The author asserts that "boom" is the wrong word to describe today's sound, healthy prosperity, which we should cherish, not fear.

The Stock Market Outlook

Harold X. Schreder

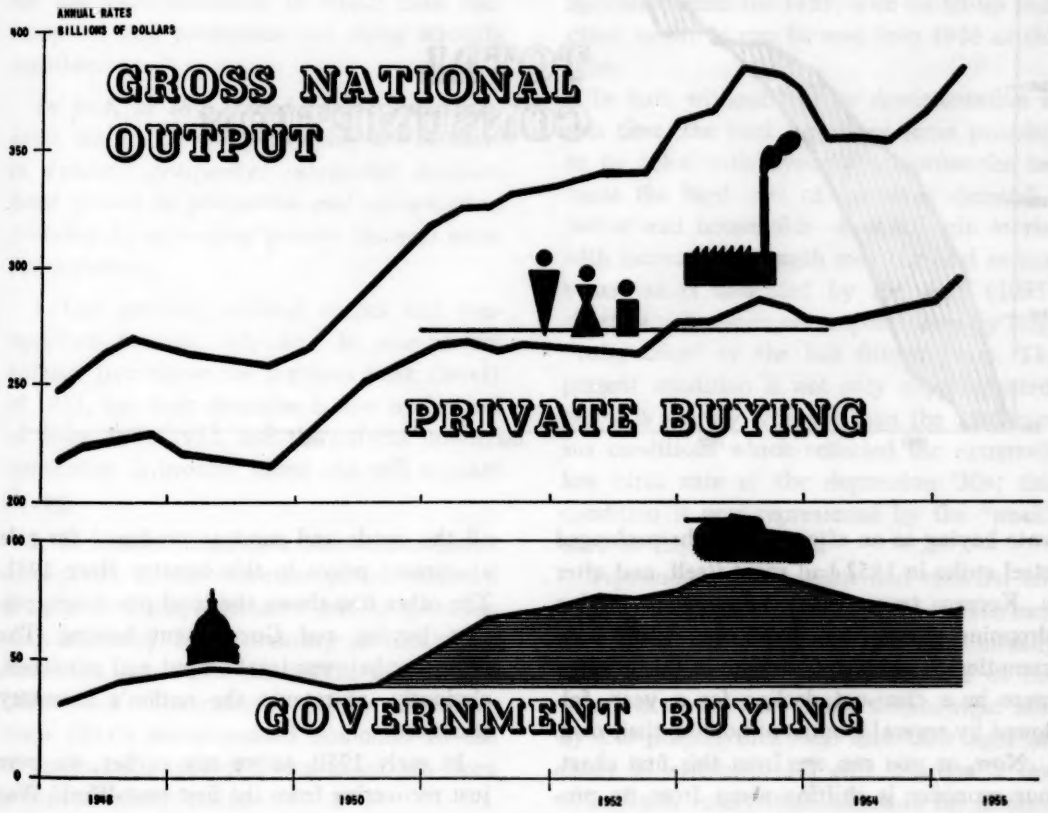
THERE isn't much argument about the fact that business conditions are excellent today. The only worry seems to be whether they can last. The future, of course, will be a product of the present in the light of the past. So, to get a "running start" on the future let us go back and look at the basic business conditions of the previous 1951–54 general adjustment period. Our clues to the future are bound to be there.

With this in mind let us first look at this chart showing our Gross National Output and the amount of Private Buying and Government Buying of this output since 1948.

Obviously, 1951–54 represented an "adjustment period" because *private* buying of our nation's products and services stopped

About the author—

Mr. Schreder, a graduate of this School, is Executive Vice-President of Distributors Group, Incorporated. This article consists of excerpts from an address before the Twenty-Fifth Alumni Conference of the School of Business Administration, May 14, 1955.

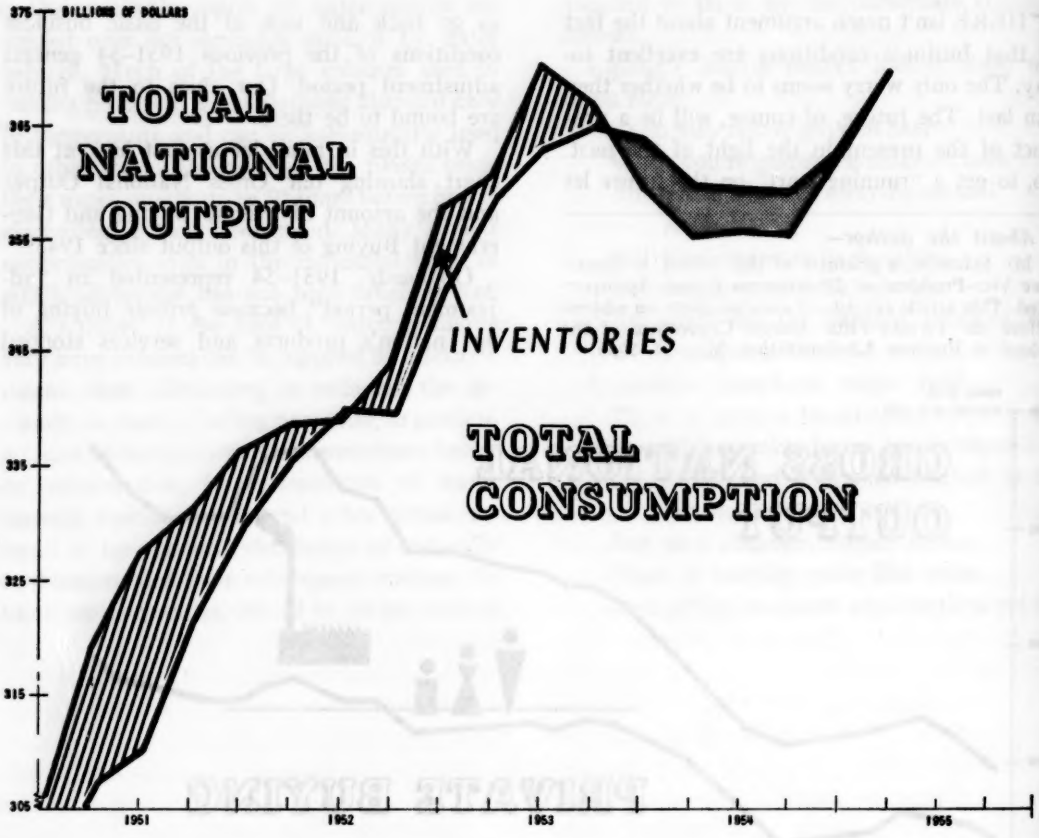


rising by early 1951, and moved generally sideways until early 1954.

Obviously, too, it was the more-than-double increase of Government buying from the middle of 1950 (when Korean war began) that camouflaged the inherently weak private demand for goods and kept our total economy going forward until the summer of 1953. By then, however, the temporarily increased private buying as an aftermath to the prolonged steel strike in 1952 had spent itself, and after a Korean truce with Government buying dropping sharply too, total output and consumption of goods and services in this country were in a clear-cut decline for a year, followed by several months of holding-their-own.

Now, as you can see from this first chart, our economy is shifting away from its prolonged *war* stimulated economy period to one "powered" more directly by *private* expenditures. The *private* buyer is clearly responsible for our current prosperity.

To get another view of the past, present and indicated future business scene, let us look at our economy's TOTAL *supply* and *demand* picture at this time. It is shown in the next chart. One line shows the total supply of all the goods and services produced for sale at current prices in this country since 1951. The other line shows the total purchases, private buying *and* Government buying. The difference between total output and purchases, obviously, represents the nation's inventory situation.



In early 1950, as we saw earlier, we were just recovering from the first post-World War

II inventory adjustment of 1949. Then the Korean War hit us in mid-1950 and in response our national output jumped so fast that a year later nearly $16 billions of goods produced were going into inventory annually, despite rising consumption. During 1951–53 our economy tried gracefully to work these huge inventories into consumption—without reducing production.

Company after company and industry after industry took its "lumps" in the process—and finally in the summer of 1953 the whole economy was hit and total output began to decline in order to get rid of the accumulated excess inventories in our economy, adjust to declining Government defense expenditures, and bring total supply into better balance with demand.

Significantly, however, total final consumption of goods and services held at high levels all through the 1953–54 recession, most of the time above production, which laid the base for the 1955 condition in which both consumption and production are rising strongly together.

In fact, as this second chart clearly suggests, we are currently enjoying the ultimate in dynamic prosperity: substantial hand-in-hand growth in production and consumption, provided by expanding private business without inflation.

1. Our growing national output and consumption are not only now in near-perfect balance just above the previous peak (level) of 1953, but their *direction* is now up instead of down as in 1953, and the current upward momentum is broadly based and still appears strong.

2. Moreover, there is a vast improvement since 1953 in the *character* of our renewed prosperity. Today, increased *private* spending, with relatively little inventory accumulation, has more than offset the decline of over $16 billions in Government defense spending since 1953's war-generated economy. In the meantime, the cost of living index has been unprecedentedly stable.

Will Today's "Perfect" Economy Continue?

The big question at the moment, of course, is how long will the present "perfect economy" continue? Obviously, no one knows. Equally obvious, however, is the fact that all the evidence at hand—new orders, production, employment, income, savings and debt, prices, consumers' and businessmen's spending intentions, and practically all the other basic economic factors—strongly indicate that total production and consumption will continue high and generally rising for some time yet.

Specifically, with Government spending levelling off at its reduced figure and private consumption still pointed upward—and recently reinforced by rising new orders and increasing capital expenditures—our earlier expectation that 1955 would be a record year seems completely justified. An all-time high gross national output of close to $375 billions appears certain for 1955, with no let-up indicated as far as can be seen into 1956 at this time.

In fact, without lengthy documentation at this time, the next decade or more promises to be filled with dynamic opportunities because the hard core of consumer demand—people and households—should begin to rise with increasing strength over the next several years, as is indicated by the next (1955) chart, which shows our unprecedentedly huge "baby crop" of the last fifteen years. The present condition is not only unprecedented, but it is sharply different than the 1940 census conditions which reflected the extremely low birth rate of the depression '30s; this condition is now represented by the "weak" area in the 1955 chart.

Tremendously important and ramified implications of this 1955 age chart—for the next decade to 1965, for example—are already "loud and clear"; the basic outline of the future is almost irrevocably shaped right now by the people, their sex, and their ages already *in existence*. I'll only mention a few of the basic future implications in the interest

of time today, so let us quickly look again at this 1955 age-population chart.

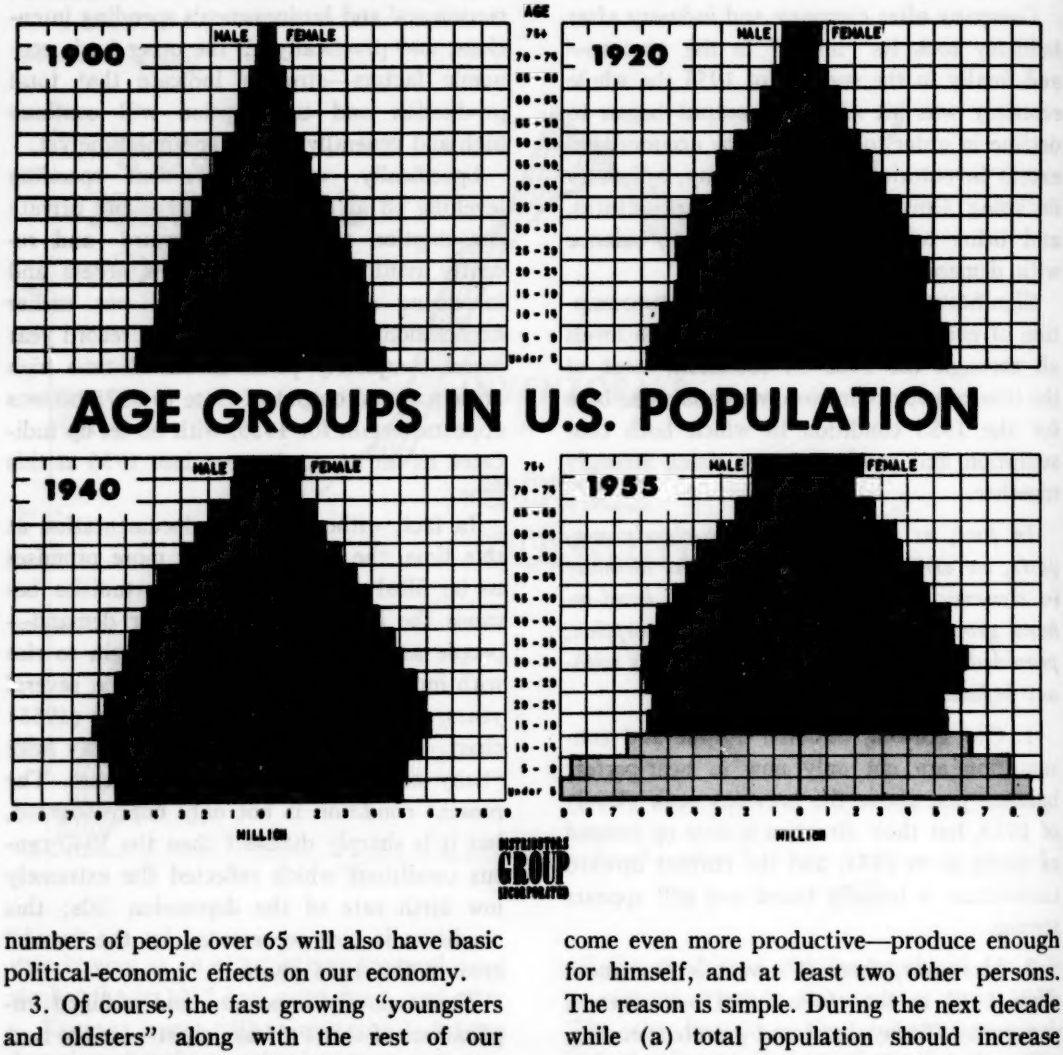
1. Surely, the first obviously predicted development, in being, is the fact that today's huge baby crop will "flood" this campus in the years immediately ahead.

2. At the other end of the age groups, it is easy to predict too that the fast growing numbers of people over 65 will also have basic political-economic effects on our economy.

3. Of course, the fast growing "youngsters and oldsters" along with the rest of our changing population will continue to provide a basic key to intelligent stock selection.

4. Economically speaking, the most clearly indicated condition of the next decade will be a tendency toward labor shortage; and the need for increasing capital investment. Today, as compared with all our past history, we have an unusually large and disproportionate number of non-productive people—those under 18 and over 65. This is not a criticism; just a fact, which means that today every American worker produces not only for himself, but for one-and-a-half other persons, too.

For the next decade, each worker must become even more productive—produce enough for himself, and at least two other persons. The reason is simple. During the next decade while (a) total population should increase about 18%, (b) people over 65 years of age should increase about 30%, and (c) people under 18 years of age should increase about 25%, so that (d) the potential labor force (18 to 64 years of age) should increase only about 10% and the (e) people actually avail-



AGE GROUPS IN U.S. POPULATION

able for work may increase only about 6% over the next decade—and insist upon a shorter work week!

Obviously, the basic problem of the next decade should not be unemployment—but a tendency toward inflationary pressures.

5. Clearly, too, then this inevitable condition means that our economy must become more productive; we must not fear the technological revolution of "automation"; we must have it. In short, we must have high levels of capital investment in plant and equipment in order to insure greater productivity per worker to supply the goods required by a dynamic growing economy, so as to increase our standard of living by preserving a sound dollar and staving off inflation.

Money Supply Versus Our Nation's Output

Our monetary authorities at the Federal Reserve Board certainly are aware of these current and longer-run inflationary pressures in our economy too, because since last December they have taken several deflationary actions to reduce the nation's money supply. Their general actions, as well as two specific stock margin increases, have clearly been directionally unfavorable to the stock market —as they were intended.

We have all heard the old saying that "money isn't everything, but it sure helps." Well, that is as good a description as any of the important role the nation's money supply plays in the functioning of our economy—greasing the way, as it were, to ease the natural business friction developed in matching up the supply and demand of goods and services.

It is readily apparent from the chart (page 14) that the great growth in our money supply took place during World War II and was added to during the Korean War. It has now grown nearly four times in the last fifteen years.

It is readily apparent, too, that while the money supply has been growing generally over the past fifteen years, so have all the other basic elements of the economy—population, employment, production, prices, etc. The one economic measure that reflects all of these basic elements is the Gross National Output which, as you all know, is the dollar measurement of the country's total output of goods and services. The ratio line of money supply to Gross National Output on the chart, therefore, puts our "high" money supply into sharper focus with the rest of the economy.

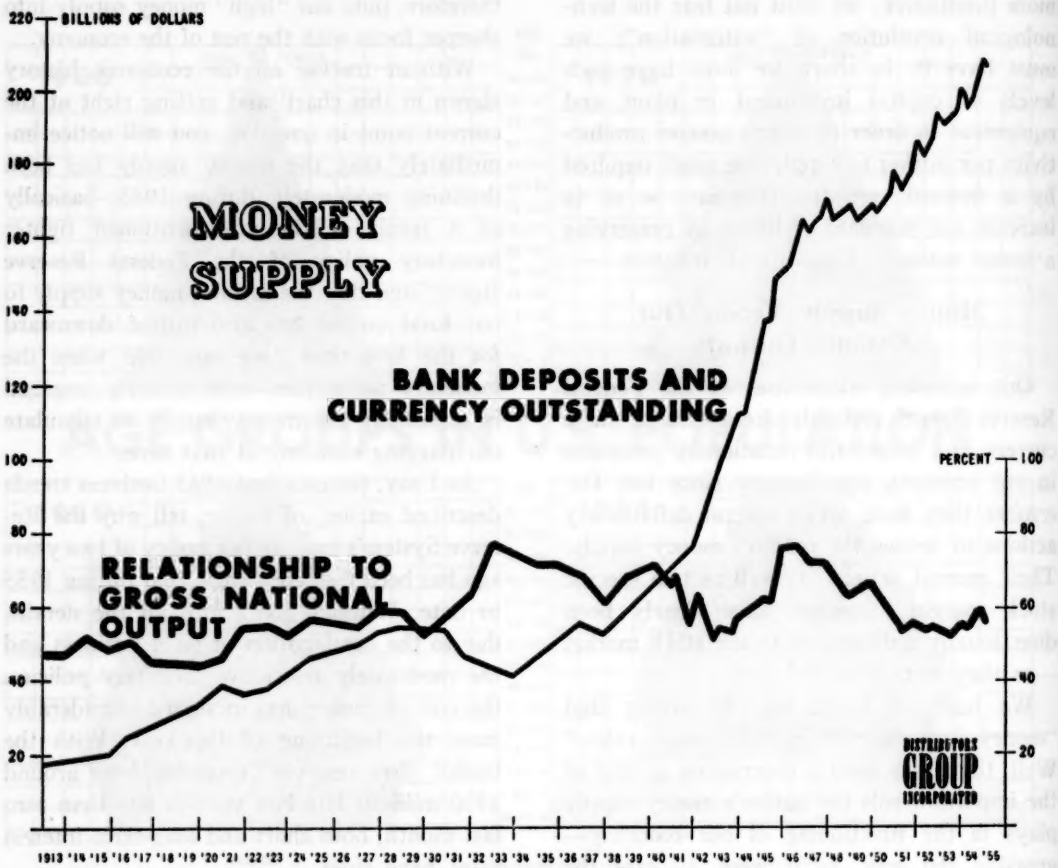
Without tracing all the economic history shown in this chart, and getting right at the current point in question, you will notice immediately that the money supply has been declining moderately during 1955, basically as a result of the aforementioned tighter monetary policy of the Federal Reserve Board; and that the ratio of money supply to our total output has also turned downward for the first time since mid-1953 when the monetary authorities were actively engaged in expanding the money supply to stimulate our flagging economy at that time.

As I say, the excellent 1955 business trends described earlier, of course, tell why the Reserve System's easy money policy of two years ago has been tightened somewhat during 1955 to date. Without going into all the details, due to the combination of good business and the moderately restrictive monetary policies, the cost of money has increased considerably since the beginning of the year. With the banks' "free reserves" dropping from around $700 millions late last year to less than zero last month, both short and long-term interest rates have risen.

Interest rates on short-term Governments since the beginning of 1955 have increased from 1.05% to the recent high of 1.70% (now a little over 1.40%); the rediscount rate has been increased from 1½% to 1¾%, and the commercial paper rate has been increased five times. Government and corporate bonds, obviously, have declined in price; the high grade corporate interest rate, for example, has risen in a year from 2.87% to 3.03% currently.

These money rate increases, naturally,

have a potential two-way effect on stock prices. In the first place, of course, if money gets too tight, it can unduly retard business as some claim was the case in early 1953. More important, however, is the fact that there is a basic relationship between bond yields and stock yields. If the spread be-



comes too narrow, stock money tends to be attracted to bonds, particularly as stock prices advance to "new high levels" as presently.

Currently, however, as an offset to recent increases in bond yields and stock prices, dividends have increased sufficiently to cause no reason for alarm about stock market *values* yet. On the basis of a conservative dividend payment of about 60% of earnings, the current yield on the 30 Dow Jones Industrial stocks, for example, is about 4.5%, providing an historically satisfactory current yield advantage of about 1.5% over high grade corporate bonds. With yields on investments being one of the most basic measures of values available, however, the continuing interaction of future monetary policies, earnings, dividends and stock prices, must be watched with extreme care at this point in our economy.

Of most recent interest, of course, is the fact that during the past two weeks, the Reserve System has *supplied* money supply to the economy by adding $150 million to its own security holdings and even more than that, on repurchase agreements. At this time, no one can be sure whether this "new easing" in money supply conditions was instituted to help the recent Treasury financing of over

$6 billions, or whether it is the beginning of the usual May-December money supply increase by the monetary authorities to accommodate the normal seasonal increase in needs for credit by business to finance the summer's crops, and general fall and Christmas requirements.

Certainly, whether we are currently witnessing the beginning of the normal seasonal increase in money supply or not, our economy will need a sizable addition to the money supply during the rest of the year if the economy's indicated requirements are to be met. How much of an increase in the money supply we get is extremely important, especially to the stock market which is always in a generally marginal position as far as the nation's money supply is concerned. It is not generally recognized that stock prices are significantly controlled by the Federal Reserve Board's monetary actions.

Values in Industries

In any event—at this time—all our work says that stocks are fairly valued.

On values in the market today, however, let me be more specific. You are all familiar with the general position, trend and importance of corporate earnings, dividends, book values, earnings ratios, yield spread, etc. in connection with stock values.

Obviously, I cannot show you all the charts we keep on all these factors to enable us to establish *intrinsic values* for hundreds of individual stocks as well as for the Dow Jones Industrial Average. In this latter connection, however, a lot of people say the "market" is too high because this stock Average is historically high in price. I do not think very much of the Dow Jones Industrial Average as a stock market index, but it is easy to show that at around 415 these days *even this "blue chip" Average is not too high.* "High," of course, refers only to price (415), so I ask, *high to what*—earnings? dividends? or assets? Our conclusions are as follows:

1. Value for the Average stock has been in a strong uptrend for the last fifteen years, but particularly so since the fall of 1953 when the Average stock was clearly undervalued.

2. The Average stock is fairly valued today at 415; our currently computed normal value is 412. Moreover, the *trend* of value is still rising moderately. (Entirely different than the wildly excessive over-valuation of 1929).

3. Thus, the Average stock is only now catching up for the extreme undervaluation of the past, particularly since the fall of 1953.

4. Finally, at this time there are many *individual* stocks that are clearly undervalued around this Average, just as there are numerous ones that are clearly overvalued around this Average.

In any event, the basic point I want to make here is that there are still some solid investment values available in the market today, and it is clear that even at "415," on the basis of historical value relationships, this "blue chip" Average *could* advance substantially more.

We definitely think that it will over the longer term ahead because its indicated normal value for 1965 is well over 600. Whether the Average stock will rise over the immediate future, obviously, we do not know. The evidence is clear, however, that the Average stock in the market today is about normally valued about mid-point at this time between a dangerous top of 490–500, and outstanding cheapness at 350–360. Obviously, we are seeking, and we think finding, individual stocks in the latter area of cheapness, quite apart from what the Average stock may or may not do.

The CED presents a positive program for reform of the Federal budget.

Budgeting Billions

J. Cameron Thomson

IN round numbers the government will spend $65 billion in cash this year. It will absorb almost one-sixth of all the goods and services produced in the nation.

This is a truly mammoth diversion to public use of the work of private men and private capital. We cannot look on it with complacency so long as we believe that democracy is best served by leaving to the private citizen as much decision as possible over how he spends his own money.

Few of us these days are so bold as to pretend that government can be anything but big. History has assigned to us tremendous challenges and responsibilities at this mid-point of the 20th Century. The survival of our very civilization depends on this nation's strength and determination.

The over-riding priority of these challenges and responsibilities, however, is not a license for waste and inefficiency. Nor is strength and determination measured solely by the amount of money government spends. In fact, our strength and stamina ultimately depend on how wisely we control government spending—how wisely we limit and direct the diversion of our natural resources from private to public use.

To spend or not to spend is one of the most crucial kinds of decisions our public officials have to make. To spend too little means to risk the defense of freedom in the world. To spend too much is to risk undermining the source of our material strength, our dynamic and expanding economy. Economic growth enables us to support with our taxes a necessarily large and expensive standing armed force. Indeed, we rely on economic growth to enable us to support big government, itself. And, of course, we rely on economic growth to spread our standard of living over our increasing population and to keep that standard of living rising.

CED'S Program for Economy in Federal Spending

A couple of years ago a group of us in the Committee for Economic Development sat down around a table in New York to talk about government spending. One of the things that distinguishes business management from some other ways of earning a living is the fact that business managers constantly have to face decisions whether to spend or not to spend large amounts of other people's money. We wondered if this duty we have in common with government leaders might suggest some contribution we could make towards a better control of government expenditures.

We decided that an important clue to the problem of a wise control of government expenditures lay in what we in business call the decision-making process—the procedures business executives follow in coming to a decision to spend or invest company funds. An efficient decision-making process is re-

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garded in business as one of the best ways of insuring against waste and unwise investment decisions. The same should be true in government.

What evidence, we asked ourselves, do we have that the procedures government follows in reaching spending decisions are efficient? How much effort, for example, is made to decide whether the costs to the private economy of an additional billion in taxes is worth the benefit to the nation of an additional amount of government service? Do the procedures followed in coming to spending decisions bring to bear the best available, relevant information? These questions are of strategic importance in determining the wisdom of government expenditures.

The decision-making process in government as far as spending goes is usually referred to as the Federal budget process—the way the Executive compiles a budget, the way Congress reviews it, and the way the budget is administered. Budgeting in government in recent years has become of enormous practical importance. For in most cases the decisions to place an item in the budget, to fix its size there, is tantamount to fixing government policy in all its practical aspects. Defense policy, for example, can't be said to exist in any meaningful way until money is actually appropriated to implement it. So it goes with most of the other activities of government.

Consequently Federal budget procedures are of enormous importance. Of course, good procedures won't insure the wisdom of government actions. But good procedures can make clear the issues involved in deciding how much to spend in any given area of government activity. Bad procedures can greatly increase the risk of bad or irresponsible decisions.

Mounting an Attack

Budgeting the billions of government is a mammoth job—far more complicated than any executive faces in budgeting the outlays of even the largest business corporations. We decided that if CED was to have anything useful to say about Federal budget procedures, we would first have to do a lot of learning.

Mighty little has been written about the Federal Budget process as it works in these days of the $65 billion budget. Our Research and Policy Committee, in whose name all CED policy statements are issued, decided this defect would have to be remedied before CED could develop any responsible judgments of its own.

Accordingly, following a CED custom, we commissioned a research study, choosing Arthur Smithies, Professor of Economics at Harvard and an alumnus of the Federal Bureau of the Budget, to do the job.

Professor Smithies was given license to scout the problem in any way he chose and to make any recommendations he wanted to. We'd shoot down his recommendations, if we could, when we saw his evidence, or we'd accept them if we were persuaded. Actually we were persuaded in many cases. CED had Smithies' study published in book form this Spring under the title, "The Budgetary Process in the United States." The book has been received very well by experts in the field. It promises to become for students of government a unique source of information about how Federal budget procedures have developed over the years in this country and about the relative responsibilities of the Executive Department and Congress for deciding what government should spend.

After Smithies had been underway a while, the businessmen of CED swung into action. The Subcommittee on Fiscal and Monetary Policy, of which I am chairman, was directed to choose a team from its members to draw up a statement of our views of the problem. S. Bayard Colgate, Honorary Chairman of Colgate-Palmolive Company, agreed to head the team. Don Mitchell, Chairman of Sylvania Electric Products, Inc., Elliott Bell, Chairman of the Executive Committee of McGraw-Hill Publishing Company, Inc., and Alan Temple, Executive Vice President of The National City Bank of New York, were recruited. We

lured Ted Yntema out of Ford's Finance Department, and the committee was graced by Anna Lord Strauss, former head of the League of Women Voters—a very sensible choice, I think, since everybody knows that women in this country are better budgeters than men. Finally we asked Bob Heller of Robert Heller & Associates, Inc., Cleveland, to join and give us the benefits of his many years experience trouble-shooting management problems in government.

The committee learned a lot in the ensuing two years of study. Working with us in the process we had the services of a staff of technical advisors—non-voting members of the team. On the staff were three other alumni of the Bureau of the Budget: Elmer Staats, now executive officer of the Operations Co-ordinating Board in Washington; V. O. Key, Jr., professor of government at Harvard; and Charles Stauffacher, now Control Officer at Continental Can. There was Don Price, Associate Director of the Ford Foundation and long time student of Federal Government Organization. Finally we had the advice of Herbert Emmerich, Director of the Public Administration Clearing House in Chicago and Ed Mason, Dean of the Graduate School of Public Administration at Harvard and Chairman of CED's Research Advisory Board. In addition we solicited the opinion and comments of several key officials in Congress and in the Executive branch.

I list all these people by way of presenting our credentials. It's no use pretending that the crucial economic problems business and the nation face—problems like controlling government expenditures are simple or can be resolved by serving up panaceas on a silver platter. You can't bring too much talent to bear. While the CED Research and Policy Committee is solely responsible for all CED says on these public problems, we try to subject our findings to the most searching criticism from professionals that we can find.

Furthermore, the hallmark of CED work is a long course of study and discussion. This team of businessmen and scholars met together eleven times in day-long discussions and put a lot of time on homework in between before a report emerged on the problems involved in controlling government expenditures. Two further day-long meetings were held by the full Research and Policy Committee before that committee voted on and approved the report.

Finally, and most important, the businessmen who serve with CED serve as individuals, not as representatives of their companies, industries, or other special interests. Most recommendations about public policies are only as good as the degree of detachment and objectivity behind them. We go to lengths in CED to make it tough for our members to be other than detached and objective. Businessmen, like the Indians, are a minority group in this country. Measured by material standards, they are a favored minority group. In fact, of all the minority groups that make up our nation, businessmen can least afford the stigma of "special pleaders." It is doubly important for us to identify ourselves with detachment, objectivity—the overall public interest.

In sum, we give our policy statements a rough road test before putting them on the market. They are tested for competence by our technical advisors. They are tested for responsibility by bringing to bear all the information possible over many hours of discussion and study. They are tested for objectivity—for their relevance to the overall public interest—by the terms of participation in CED and by final review of detailed work by our whole Research and Policy Committee.

Of course, when any group of intelligent people delve into a problem beyond the realm of generality disagreements are commonplace. Not only do the scholars and businessmen often disagree; the businessmen and scholars disagree among themselves. We try to get the best consensus possible in CED before going on record. But the right, in fact the duty, to be recorded as dissenting and to present a written dissenting view is fundamental in

CED procedure when the inevitable honest differences of opinion crop up. Most members of our Research and Policy Committee—the businessmen who must vote and take responsibility for CED statements—have exercised this right at one time or another, dissenting from sections or paragraphs or individual recommendations. The last 10 CED statements have carried in all 28 dissenting footnotes—about three per statement—involving at one time or another 21 different members of the Research and Policy Committee. I feel these written dissents add considerably to an understanding of the issues to which we address ourselves in CED.

While I'm talking about our indispensible dissenters, I should point out that the recommendations that come out of CED's studies often disagree with opinions prevailing in large segments of the business community. It is immensely encouraging to me that the business community continues to support CED despite its occasional deviations from the norm of business opinion. I am particularly happy that we get continued support from some of our trustees and contributors who, I'm sure, have disagreed with one or another of our recommendations. (We don't dragoon our contributors and trustees into taking responsibility for the CED statements; responsibility is limited to the members of the Research and Policy Committee.)

What we get from our trustees and contributors is support for CED's basic philosophy—that business has much to gain by subjecting its opinions to the hard test of research and free discussion. After all, the specific recommendations are of less importance than the principle that the right to disagree must not only be tolerated but defended. This principle is of special importance to the American businessman. Freedom in the market place for goods is unlikely to survive without freedom in the market place for ideas.

But back to my story and the control of government expenditures. As the chapters of Professor Smithies' book began coming in, our team of businessmen and technicians began taking the Federal Budget process apart, piece by piece, testing its efficiency and effectiveness against sound economic and sound business sense. Our subject was big—as big as government itself—so I don't pretend we looked into every nook and cranny. But we did uncover some striking weaknesses in the way government goes about deciding whether to spend or not to spend. And we came up with some recommendations for strengthening the decision-making process which at least stood up to the critical test of our demanding peers on the Research and Policy Committee.

The Results

The document that resulted from all this labor made three general criticisms of the Federal budget process:

1) The information on which Congress must rely in making decisions to appropriate money is both inadequate and disordered. It is inadequate in that it fails to show in terms of national policy objectives why government is requesting money. It is disordered in that it is cluttered up with a lot of extraneous detail about government operations which should only indirectly effect decisions to spend or not to spend.

2) The continuing problem of operational efficiency in government is not attacked in a continuing, systematic manner.

3) Congress reviews the budget in bits and pieces, never looking at spending as a whole. This is bad on two counts: First, the various impacts of the Federal budget on the private economy—that is the relationship between tax and expenditure policies—do not get adequate attention in Congress. Second, Congress largely ignores the fact that most government programs compete with one another for funds in the budget and therefore cannot be adequately judged separately.

I'd like to comment on each of these general critcisms and indicate how we in CED think these weaknesses can be remedied.

Needed: A Program Budget

First, the information on which Congress bases its appropriations decisions.

The biggest thing you can lay your hands on in the Federal budget process is the budget document. This volume of more than 2,000 pages should be a very useful sourse of information for the average Congressman. Here is the one place where all of the government's requests for money are put down together. Ideally, the Congressman should be able to read alongside each entry a description of why the government is asking for this money —to decide whether the various requests are fitting expenditures for the Federal government to make. Ideally, the Congressmen should be able to compare the various requests with one another and form some opinion as to whether we are spending the right amounts on, say, the various farm programs and the various defense programs or whether some programs should be increased at the expense of others.

Despite several technical improvements in recent years, the budget document still falls considerably short of these ideals. In fact, it's hard to find in Washington anyone who thinks the document is as useful as it should be. The reason is easy to see if you take the trouble to thumb through the pages. You will find voluminous statistics about the goods and services government wants to buy with its money—materials, transportation, stenographic services and the like. But you will find precious little information about what the government wants to use all this paraphernalia for.

Take the Veterans' Administration section of the budget for example. It doesn't do the average Congressman much good to know that the VA hires so many doctors and nurses, so many accountants and stenographers, buys so much food and authorizes so much in travel expenses. The VA happens to be involved in the insurance business, in education, and in providing medical care for veterans, among other things. That VA needs a lot of paraphernalia to operate all these businesses is an important but separate fact. What Congressmen need to know first is how much each of these meaningful activities costs, what kind of service results from the expenditure, and whether government is justified in providing the service or whether it could better be left to private organizations.

To take the example one step further, ask yourself what kind of things you need to know in order to judge the wisdom of a government program for providing medical care for veterans. Well, chances are you'll want to know something about the number of patients and beds in VA hospitals; how many patients are there as a result of service-connected disabilities, how many as a result of non-service-connected disabilities; how does the cost of running VA hospitals compare with the cost of running civilian hospitals; is there an unsatisfied demand for service-connected medical care which justifies building new VA hospitals?

In this year's budget document you can't find answers to many of these questions. The relevant information, such as is presented at all, is scattered throughout eight sections of the VA budget.

Of course, much useful information is brought out in bits and pieces at the hearings held by Congressional committees charged with reviewing VA operations. But only a handful of Congressmen ever attend these hearings. Not many more have time to read the published version of this testimony which appears a day or two before Congress is asked to vote on the VA money bill. In any case much of the information belongs rightfully in the budget document where all Congressmen can see it, can make up their own minds about the adequacy of VA's program and can compare this claim on the budget with all the other claims.

There are endless examples like this in the budget document. In fact the VA has actually been more successful than most agencies in presenting Congress with useful information. The Defense Department is at the other end of the scale. How, for instance, can a Congressman or anybody else be expected to judge the wisdom of the Air Force's spending estimate of $6.1 billion for this fiscal year?

The reader is given 200 words of general description to explain almost one-tenth of the Federal government's spending this year. Nowhere is there any intimation of the amount of air strength we have; how spending is distributed among air defense, offensive air power, and air transport; how much money is needed to maintain this strength; how much money is needed to build up strength in each broad category.

Security undoubtedly would take its toll of this kind of information. But the fact remains that as things stand the overwhelming majority of Congress, to say nothing of the public, is left without any really pertinent information with which to draw the line between waste and wisdom in defense spending, now almost two-thirds of the Federal budget.

What's needed is a reorganization of information in the budget document into programs of government service which are understandable to the average Congressman. There should be more words about medical care for veterans, its benefits and its costs, and less facts and figures about nurses and doctors and other personnel and their salaries.

The President's annual budget message to Congress, which accompanies the budget document, illustrates in a very general way the sort of thing that is needed. The message talks about spending in terms of national security activities; social security, health and welfare activities; natural resources and so forth. These headings are much too broad to provide the basis for appropriations decisions. But the message at least talks about why government needs money in terms of national policy objectives.

To draw up a detailed example of a program budget for the government would require a more intimate knowledge of government services than anyone outside of government is likely to have. Nonetheless, we found many supporters for the idea in the Bureau of the Budget and elsewhere, and we could find no evidence that insuperable problems lie in the way of its gradual adoption.

The potential rewards to the nation of program budgeting are so great that progress towards this goal should be a matter of urgency. Congress stands to gain most from a program budget. Despite the elaborate volumes of statistical information supplied by the Executive, despite prolonged testimony by government officials, few Congressmen in these times have more than a hope and a prayer that they have appropriated the right amounts of money for each of the activities of government. The average Congressman couldn't digest in its entirety the feast of facts and figures the Executive now serves up in support of the annual budget if he had a year to sit over it.

The plight of the Congressman in budget matters is serious. Control of the nation's purse is both the symbol and the instrument of Congressional authority over the Executive. The huge expansion of government spending over the past two decades—from $3 billion in 1929 to $9 billion in 1939 to $65 billion in 1955—has frustrated this authority in large part—and frustrated many Congressmen at the same time. The same expansion of government has placed us in our present predicament between the demands of economic growth and the demands for government services. A program budget would make a significant contribution to the relief of frustration in both of these matters.

Two Kinds of Efficiency

I said earlier that the budget document should talk more about things like medical care for veterans and less about salaries, expense accounts and the costs of paper and pencils. This doesn't mean that government operations as opposed to government policies are unimportant. Far from it. There is a crying need in government for modern management methods, for a continuing and systematic program for the elimination of waste.

The detail on government operations in the budget document, however, doesn't serve this purpose. In fact, the way this information is presented now is a serious liability. Its presence in the document tends to take Con-

gress' eye off the ball—off the real issues Congress has to decide in appropriating money.

We in CED felt that much of the work that now goes into the document could well be diverted into a system of annual reports on performance from each and every government department. These reports, where possible, would talk about unit costs of government operations and otherwise indicate a continuing search for ways to provide more service for less dollars. Most attacks on operational inefficiency in government now are more in the nature of trouble-shooting operations than they are a systematic approach to the problem. Yet inefficiency, as every businessman knows, is a continuing problem.

On the basis of these departmental performance reports, the President should submit to Congress each year a separate report on the performance of Executive departments and agencies. This report should include an account of measures that have been taken to increase efficiency and of measures contemplated in the coming year. It should discuss problems like personnel policy which cross departmental lines. Finally, it should contain, perhaps as an appendix, much of the detail on what government agencies spend on travel, stenographic help, supplies and materials and so forth which now clutters up the budget document.

A business-like attack on inefficiency in government operations also requires a thorough management audit of each government department once every several years. Such an audit—supervised by the Bureau of the Budget—should cover every aspect of departmental work—the allocation of authority and responsibility, the flow of work, the efficiency with which functions are performed, (including comparisons of unit costs of similar operations where possible) personnel policies, disposition of unexpended appropriations, and so on. The President should report to Congress on the major findings of these audits and on consequent action that has been or will be taken.

The adoption of a systematic program for attacking inefficiency in government will depend primarily on a better understanding between Congress and the Executive of their respective jobs. Over the years Congress has become used to concentrating on details—even trivial details—of agency operations at the expense of giving adequate attention to the broad issues posed by the budget. The welter of detail now in the budget document is there largely because Congress demanded it in the first place.

There are two very distinct kinds of efficiency involved in government spending. There's the big problem of deciding what government should do and what government should not do—the problem of the most efficient use of national resources devoted to government. Congress' first duty is to address this problem.

Then there's efficiency as we know it in business—the problem of finding the right man for the right job and seeing he goes about it in the right way. The main responsibility for this problem of efficiency lies with the Executive. Not only is this clearly the intent of the Constitution; good management requires that the responsibility and power to administer the activities of the Executive branch reside with the President.

Congress should recognize the essential difference between these two kinds of efficiency and leave to the Executive that which is clearly the Executive's job. Not that Congress has no interest in operational detail. Congress must receive enough information of the right sort to determine that government activities are being efficiently performed and that they are promoting the objectives of the authorization laws. A yearly report on efficiency from the President would help fill this need without impinging on Congress' primary duty to fix the level of spending for each government activity.

The Budget in Congress

The third general criticism we in CED have of the Federal budget process centers

on the way Congress goes about reviewing the budget.

"Where in government," we asked ourselves, "does some group look at each year's budget as a whole and compare the benefits the nation gets from government services with the things individuals and businesses give up to make these services possible?" We feel this is one of the most crucial considerations involved in deciding whether to spend or not to spend. Unless tax policies and expenditure policies are co-ordinated at all levels, nobody can really claim that spending decisions have been made with full regard to the consequences.

On the Executive side of the government several groups—the Treasury, Budget Bureau and the Council of Economic Advisers, for three—have the different impacts of tax and expenditure policies on the private economy very much in mind. The President's budget reflects a co-ordination of the views of these groups, though undoubtedly more could be done by way of explaining these all-important relationships than is now done in the budget document.

In Congress the Joint Committee on the Economic Report has these matters under study indirectly as part of its job of fulfilling the directives of the Employment Act of 1946. But no group reviewing the budget each year in Congress has the job of judging each year's annual budget from the standpoint of co-ordinating tax and spending policies. In fact, no group in Congress reviews the annual budget as a whole.

One of the most worthwhile suggestions, I think, which came out of CED's study was for the establishment in Congress of a Joint Budget Policy Conference to plug this hole in the budget process. The Conference should meet right after Congress receives the budget from the President to discuss, primarily, the relationships between the President's tax program and the President's spending program—that is the various impacts the budget as a whole will have on the private economy. The Conference should hold hearings with the Director of the Bureau of the Budget and any other high administration officials it may wish to hear.

For this job the Conference needs to include the majority and minority leadership of the tax and appropriations committees of both houses, representatives of the majority and minority party leadership in both houses, and the majority and minority leaders of the Joint Committee on the Economic Report. These key figures in Congress should try to reach a consensus on the major issues posed by the budget. But even if there was no consensus, the deliberations of the Conference would be of value merely by acquainting the heads of the tax and appropriations committees with each other's problems. Right now the work of the appropriations committees of Congress is carried on in magnificent isolation from the work of the tax committees and vice versa. Getting the leaders of these committees together is the first step towards coordination in these highly interrelated fields.

The Conference should not encroach upon the functions of the appropriations or tax committees by trying to lay down the law as far as levels of spending and taxes are concerned. Probably the Conference should even avoid issuing a report at this time. In the past, attempts to fix spending ceilings in advance of the investigations of the appropriations committees have always been resented by the latter as unwarranted intrusions on their powers.

At the same time the deliberations of the Conference should be of special use to the chairmen of the appropriations committees. Coordination of the appropriations process in Congress is badly needed.

Right now the appropriations committees as a whole have little more than perfunctory duties. The appropriations process is dominated by the various sub-committees—11 in the House and 10 in the Senate—which review special sections of the budget, hold detailed hearings with government officials, and make recommendations that carry great weight with the House and Senate as a whole.

Again, each subcommittee acts virtually in isolation from all the others. This would be all right if it weren't for the inescapable fact that what we spend on one government service, say the farm program, depends in part on what we have to spend on other programs, say defense. Painful as these comparisons may be Congress cannot avoid them if it is to find the right balance in government spending.

The chairmen of the appropriations committees are among the most influential men in Congress. After the hearings and discussions of the Joint Budget Policy Conference, they should find it possible to work out with the chairmen of their subcommittees a system of guidelines in the form of tentative dollar ceilings for sizeable groups of government activities. These guidelines would serve as a framework for the recommendations of the appropriations subcommittees—a reminder, if you will, that government requests for money cannot be viewed as unrelated. These guidelines, of course, would be regarded by all as tentative; otherwise there would be little reason for the hearings and recommendations of the subcommittees.

Later in the session, but before the major revenue and appropriations bills are reported to the full House, the House members of the Joint Budget Policy Conference should meet again, calling administration officials to testify as needed. At this time it might be desirable to issue a report on expenditure-revenue problems for the guidance of the House as a whole before money bills are voted on. The House as a whole, no less than the appropriations subcommittees, needs to be reminded that the separate money bills they vote on add up to a total, are usually competitive with one another for funds, and that the total has important consequences for the revenue side of the budget and for the nation's economy.

Still later in the session a similar procedure would be followed on the Senate side, with Senate members of the Joint Budget Policy Conference meeting and reporting before the Senate votes on the major tax and appropriations bills.

Participation of the Congressional leadership in the Joint Budget Policy Conference would be indispensable to the success of the device. The leaders of the two parties in Congress are the major source of responsibility there and their influence needs to be brought to bear more directly on spending decisions. We are not proposing a new supercommittee with quasi-dictatorial powers. We are proposing efficient ways of channelling information in Congress so that all aspects of the budget are brought home to the key decision-making committees. Today the budget process in Congress is splintered. Responsible spending decisions depend on bringing the pieces together at certain points so Congress can look at the budget as a whole.

* * * *

Program budget. Annual reports on performance. Joint Budget Policy Conference. Not an easy bill of goods to sell, you may say. But I suggest it is well worth your while, as it has been well worth mine, to give these problems some of your time and energy.

Businessmen and bankers, particularly, have a vital self-interest in seeing to it that government expenditures are controlled as wisely as possible. It is not that the taxes these expenditures require will necessarily put us out of business. But these taxes do at points impinge on the growth and vitality of the economy—the very foundation of our material strength.

One of the most important contributions businessmen can make to their country these days is to use their influence to bring businesslike precision and thoroughness to bear in finding solutions to the national economic problems of the day. If he is willing to work at it, and if he takes care to tread the straight and narrow path of detachment and objectivity, there is a lot a businessman can do—even about such an awesome problem as controlling government spending.

A merger proposal has many facets. Here a recent proposal is examined from the marketing side as seen by one of the participants.

Some Aspects of the Proposed Bethlehem-Youngstown Merger

C. H. H. Weikel

IT is not my intention in this paper to go back into the corporate history of events in this country that led to the Sherman and Clayton Acts. I believe that you will all agree that the United States is now, and has been since the end of World War II, a rapidly expanding economy. Industry must expand to provide the facilities and products required in the present and future growth of this growing economy. Government policy should encourage this growth. Large sized companies are necessary today if we are to achieve high technical efficiency, promote the rapid economic expansion required by the world position of the United States, and enjoy vigorous healthy competition. Large companies resulting from mergers are helpful in achieving these ends, providing they do not result in the monopolistic tendencies which are inimical to the economy but do result in technical efficiency, economic growth and vigorous competition which might not otherwise occur.

The steel industry today is especially cognizant of the distinction between curbing monopoly and promoting technical efficiency, growth and competition since it is the result of innumerable mergers by practically every company in the industry. The strength that carried the industry through two major wars, the depression of the '30s and the large postwar expansion program caused in large part by high peacetime demand, is the result of various combinations of internal growth and mergers covering many different products, consuming industries and geographical markets. Bethlehem's large plants at Sparrows Point and Lackawanna are excellent examples of acquisition and subsequent growth based on large scale production covering different products, consuming industries and geographical areas, with resultant economies benefiting consumers, employees and stockholders alike. It behooves all of us with the long-term interest of all industry at heart to strive to prevent the establishment of any artificial barriers to technical efficiency, growth, and competition in the name of "curbing monopolistic tendencies."

You are all aware of the fact that the Department of Justice has reached the conclusion that it could not approve the proposed merger of Bethlehem Steel Corporation and the Youngstown Sheet and Tube Company. You probably do not know that the proposal that Bethlehem acquire the properties and assets of Youngstown was initiated by Youngstown, fundamentally for the purpose of finding a way for its owners to participate

About the author—

Mr. C. H. H. Weikel is Manager of Commercial Research for the Bethlehem Steel Company. This article was presented as an address before the Twenty-Fifth Alumni Conference of this School, May 14, 1955. The views are, of course, those of the author and not an expression of editorial policy.

in a greater diversification of products and markets.

Section 7 of the Clayton Act, as amended in 1950, states in part that mergers are to be prohibited ". . . where in any line of commerce in any section of the country, the effect of such acquisition may be substantially to lessen competition or to tend to create a monopoly." I would like to present the facts in the case relevant to the acquisition of the Youngstown properties by Bethlehem, and to show that such acquisition—at least in the mind of the marketing man—has no such result.

Market Relationships

The shipment figures that I will use today will be for the year 1953 measured against the total steel capacity as of January 1, 1954 as they are the basis used for our study that was presented to the Department of Justice.

In order to give you an idea of the relative size of Bethlehem and Youngstown, let me show you how they compare with the United States Steel Corporation and the steel industry as a whole. Steel capacities (ingots and steel for castings) as of January 1, 1954 in the United States were as follows:

	Tons	Percent of U. S. A. Total
U. S. Steel Corp.	38,715,000	31.1%
Bethlehem	18,500,000	14.9%
Youngstown	5,520,000	4.4%
All other	61,595,410	49.6%
U. S. A. Total	124,330,410	100.0%

This table shows that U. S. Steel Corporation is still by far the largest producer in the industry. It has over 31% of the country's total steel capacity with large production facilities in Pennsylvania, at both ends of the state—Pittsburgh and Morrisville; in Birmingham; in Youngstown and Lorain, Ohio; in Illinois; in Utah and in California. U. S. Steel is more than twice as large as Bethlehem and over seven times the size of Youngstown. Even after the proposed acquisition, the steel capacity of Bethlehem-Youngstown would be less than ⅔ that of U. S. Steel.

While on the subject of capacity, I should like to point out that contrary to popular belief, the greatest part of the growth of Bethlehem and Youngstown has been by expansion of their own facilities rather than by merger. In the case of Bethlehem, about ⅔ of its current capacity is the result of expansion of its own facilities with only about ⅓ the result of acquired facilities; in Youngstown's case about ¾ represents expansion of its own facilities with ¼ that of acquired facilities. Neither company has acquired steel producing facilities from any other company for a quarter of a century.

As most of you realize, the market for steel products is limited to a considerable extent by geographical consideration—quite different from automobiles where all makes of cars are sold throughout the country—as one common market. Steel products are heavy and the cost of transporting them to the market is high. Because of high transportation charges, producers sell in different segments of the country with a substantial variation in sales intensity.

Bethlehem's plants are located in the eastern part of the United States, with three small plants on the Pacific Coast. Youngstown's plants are located in or near Chicago, Illinois and Youngstown, Ohio.

Bethlehem ships but little outside of its own natural markets in the eastern and western areas while Youngstown's shipments are confined largely to the mid-continent area. Bethlehem is not a material factor in the mid-west and its position in the important steel consuming market around Chicago is relatively non-existent. Similarly, Youngstown's position in the eastern and Pacific coast areas could be so defined.

Many strong competitors exist in all markets where the combined Bethlehem-Youngstown Company would operate. The two companies do not overlap. Accordingly, the combined company would remain, as one or the other of them is today, only one of many

competitors at each point. The combined company would not be able to control production or prices in any market.

I know of no industry that makes available for public use as much information as does the steel industry. The current directory of iron and steel works in the United States, published in 1954 by the American Iron and Steel Institute, lists the products and capacities of 144 steel-producing plants in the United States which are operated by 84 steel-producing companies. The United States Steel Corporation is the only company that operates steel plants in each of the three large geographical segments of the United States. Ten companies, one of which is Bethlehem, operate steel plants in two of the three segments and seventy-three companies, one of which is Youngstown, operate steel plants in only one of the segments.

A comparison of the production facilities of Bethlehem and Youngstown reveals that the companies have in common but six finished steel products, namely—

SHEETS AND STRIP
BAR MILL PRODUCTS
TIN MILL PRODUCTS
ROD MILL PRODUCTS
PLATES
BUTTWELD PIPE

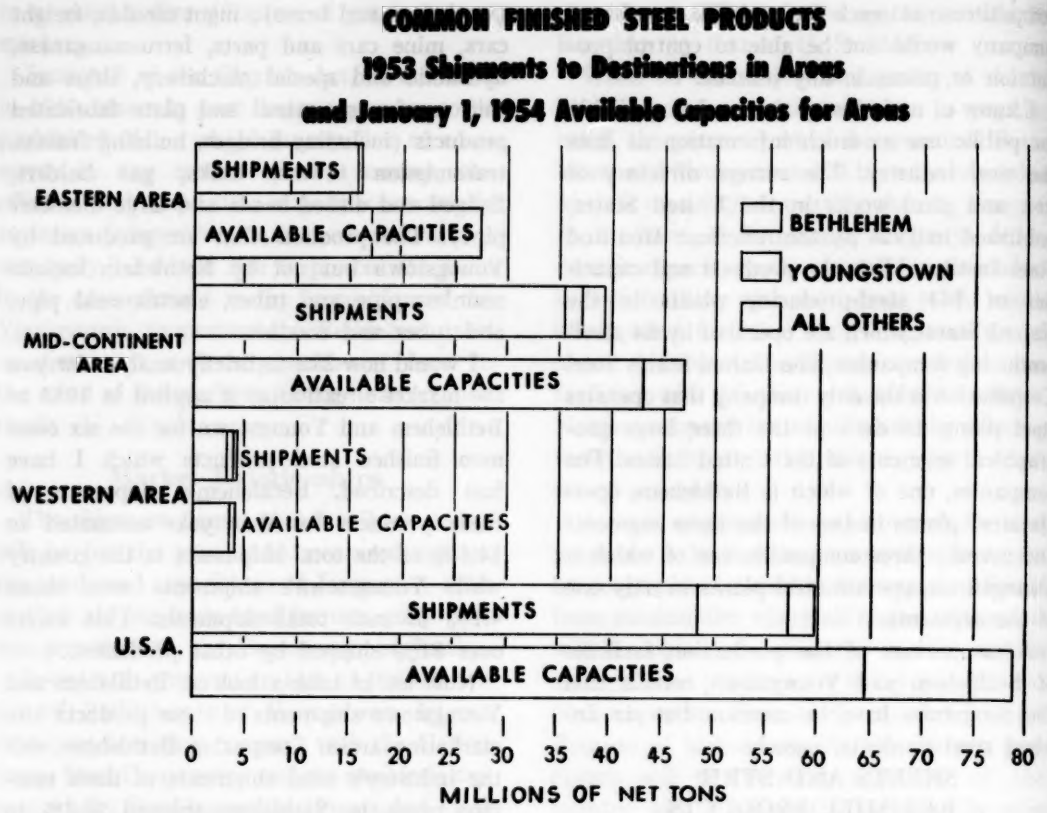
Both companies also produce pig iron and semi-finished steel products, coke oven by-products and oil well drilling and production machinery but this group is relatively unimportant sales-wise as compared to the common finished steel products and the amount of competition between the two companies is negligible.

Bethlehem makes many products not produced by Youngstown such as rails, structural shapes, reinforcing bars on a commercial scale, piling, tool steel and small tools, wire rope and strand, barbed wire, woven wire fence, bale ties, nails and staples, building and highway products, lapweld pipe, frogs and switches, splice bars, tie plates, rail joints, steel ties, bolts, nuts and rivets, wheels and axles, forgings, both heavy and drop; castings (steel, iron and brass); ingot moulds, freight cars, mine cars and parts, ferro-manganese, hydraulic and special machinery, ships and ship repairs, structural and plate fabricated products (including bridges, building frames, transmission towers, tanks, gas holders, flanged and dished heads and large diameter pipe). The products that are produced by Youngstown but not by Bethlehem include seamless pipe and tubes, electric-weld pipe, and tubes and conduit.

I would now like to briefly analyze for you the market situation as it applied in 1953 to Bethlehem and Youngstown for the six common finished steel products which I have just described. Bethlehem's shipments of these products for that year amounted to 14.5% of the total shipments in the country while Youngstown's shipments were about 4.1% of such total shipments. This leaves over 81% shipped by other producers.

Now let us take a look at Bethlehem and Youngstown shipments of these products into marketing areas. Comparing Bethlehem with the industry's total shipments of these common products, Bethlehem shipped 38.3% in the eastern area, 18.7% in the western area, and only 4.3% in the mid-continent area. Similarly, Youngstown's shipments were 1.8% in the eastern area, 0.8% in the western area and 5.5% in the mid-continent area. These figures show rather clearly that each company had the greatest market participation in their own natural market areas. To further emphasize the point, and stating it another way, 80.4% of Bethlehem's total shipments of these products went into the eastern and western areas and 87% of Youngstown's shipments went into the mid-continent area.

It is somewhat difficult to tell this story without the use of statistics but if you will bear with me a little while longer I think I can show to you that there is no substantial competition between Bethlehem and Youngstown in any section of the country. I have just stated that Youngstown's participation in the eastern and western areas was almost negligible and that Bethlehem's participation



in the mid-continent area for these products was only 4.3%. Now let us take a further look at this 4.3% figure.

As all of you so well know, a large percentage of the automotive production of the United States is centered in the state of Michigan and consequently large tonnages of steel products are consumed here and every major steel producer participates in this large market. Of Bethlehem's total shipments of common products in the 27 states making up the mid-continent area, 65% of that total (of but 4.3%) went into the state of Michigan. However, this total represented only 10.7% of the total shipments by all producers to destinations in Michigan. Youngstown's shipments of common products amounted to 2.3% of the state's total, or a combined percentage of 13% for both companies. This means that steel producers other than Bethlehem and Youngstown made 87% of the total shipments of the common finished steel products to this state.

I have mentioned the Michigan situation in some detail because of what I feel is your own interest in this market, and, furthermore, for the reason that the Department of Justice has indicated that the fact that Bethlehem sells substantial amounts of the common finished steel products in a few restricted communities in the mid-continent area, *Particularly in Michigan,* is one of the important reasons why the Department reached the conclusion that it could not approve the proposed acquisition.

Thus far I have attempted to give you a brief picture of the market situation as it applies to the common products of Youngstown and Bethlehem, and to show why we do not believe that a Bethlehem-Youngstown combination in any manner lessens competition or tends to create a monopoly. I would

like to tell you of the advantages that such a merger holds in prospect.

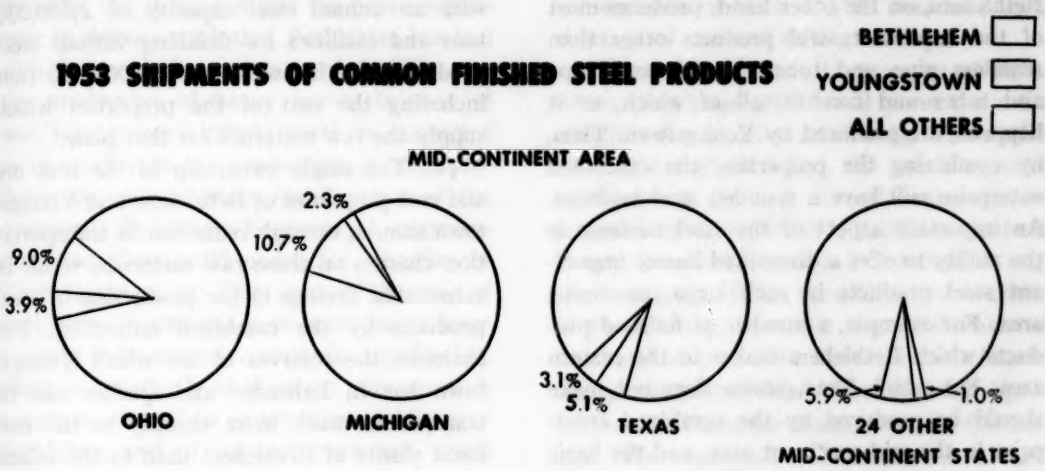
After thorough study, both companies determined that their businesses and properties complemented each other, without overlapping, and to an extent believed to be unique in the steel industry, and that the combined enterprise would be able to compete with other steel companies more effectively than the two companies can now do separately. It has been determined that by uniting the two companies, substantial reductions in costs and improvements in service would be made possible and that the normal growth and development of production to meet future increases in demand, wherever they may occur, would be facilitated. These objectives are concededly in the interest of the owners of the two companies and it is believed that such objectives also coincide with the public interest.

Argument for Merger

The principal reasons for believing that it is advisable to proceed with the merger are:—

(1) Since the steel business requires an exceptionally high plant investment, it is very important, in order to maintain the plants and continue them in a position to serve the consuming public, that their rates of operation be as stable as possible. Diversified markets and diversified lines of products make for stability of operations and for stability of employment. The combined enterprise that will result from the acquisition by Bethlehem of the properties of Youngstown will have a greater diversity of markets and a greater diversity of products than either Bethlehem or Youngstown alone now has and therefore, result in greater stability of operations and employment.

(2) As stated before, the steel plants of Youngstown are located in or near Chicago, Illinois, and Youngstown, Ohio; and those of Bethlehem (except for its small steel plants on the Pacific Coast) are located in the eastern area. The bulk of the steel capacity of the country is concentrated in and around Pittsburgh, Youngstown, Chicago, Cleveland, and Detroit. The significance of that fact has greatly increased in the last few years as large steel consuming industries have been established in Ohio, Michigan, Indiana, Illinois and Wisconsin. The combination of the properties of Bethlehem and Youngstown would enable the combined enterprise to offer its products for sale in that large steel consuming market on a more favorable basis of competition with the plants in and around Pittsburgh and other cities just referred to. Thus the combined enterprise would be able to compete more effectively in that market than the two companies are now able to do with United States Steel Corporation, Republic Steel Corporation, Jones & Laughlin Steel Corporation, National



Steel Corporation, Armco Steel Corporation, Inland Steel Company and other steel-producing companies with plants located in that market.

(3) Ideally, in the interest of competition, stability, and growth, Bethlehem and Youngstown should aim to produce a widely diversified line of steel products. At the present time, Youngstown is not in that position and cannot expect, under reasonably foreseeable conditions, to acquire immediately facilities for substantially expanding its lines of products. Bethlehem, on the other hand, produces most of the important steel products other than seamless pipe and tubes, electric-weld pipe and tubes and conduit, all of which, as it happens, are produced by Youngstown. Thus, by combining the properties, the combined enterprise will have a rounded steel business. An important aspect of the steel business is the ability to offer a diversified line of important steel products in each large consuming area. For example, a number of finished products which Bethlehem makes in the eastern area, but which Youngstown does not make should be produced by the combined enterprise in the mid-continent area, and the basic steel-making facilities of Youngstown plus the "know-how" of Bethlehem would permit such production. Under present conditions, the creation of this additional competitive force in the middle west by either of the two companies acting separately is remote. This is true for several reasons. Although Youngstown has basic steel-making facilities in that area it would be required to make extremely large expenditures for new finishing facilities in lines of products with which its organization is not familiar, with the attendant risks of manufacturing and merchandising new products. Bethlehem, on its part, although an experienced producer of such finished products, would be required to make even larger expenditures for both basic steel facilities and finishing facilities in order to produce such products in the middle west. In order to give you some idea of the large capital investment required for iron and steel producing facilities, I would like to give you a few examples. A single blast furnace costs about $13,000,000; a battery of coke ovens (consisting of 79 ovens) costs about $15,000,000; and an open hearth furnace costs about $3,500,000; plants of an effective competitive size usually contain a number of such facilities, so that the total investment is very large. A modern structural mill would cost in the neighborhood of $75,000,000. The press reports that the new steel plant at Morrisville, Pa. which was recently completed by U. S. Steel Corporation, with an annual steel capacity of 2,200,000 tons and facilities for finishing various steel products, cost in excess of $450,000,000 (not including the cost of the properties which supply the raw materials for that plant).

(4) The single ownership of the iron ore and coal properties of Bethlehem and Youngstown should, through reduction in transportation charges on these raw materials, result in substantial savings in the production of steel products by the combined enterprise. For example, the reserves of ore which Youngstown has in Labrador and Quebec can be transported much more cheaply to the east coast plants of Bethlehem than to the inland plants of Youngstown, for which other iron ore of the combined enterprise will be available.

(5) The unification of these properties will reduce costs not only through the flow of raw materials to the plants at which they can be assembled at the lowest cost, but also through the economical allocation of orders for steel products, through a reduction of overhead expense and through the elimination of duplication in the cost of distributing those products, such as cross hauling. The combined enterprise will thus be able to reduce costs of production and distribution, which will permit more effective competition with other steel companies.

(6) Another very important advantage that would result from the proposed merger is that it would greatly benefit national defense, and in these troubled times we feel that this is a very important point.

Bethlehem has had broad experience in the production of those heavy steel products, such as structural shapes, heavy forgings, armor plate, rails and the like that are in great demand in the general expansion of production that occurs in wartime; it has had a long background of ordnance production; it has had pre-eminent experience in the production of munitions and steels for munitions.

Youngstown has, of course, always taken part to the fullest in past defense efforts by its production of items within the limits of its mills, but it has not had the broad experience in defense work that Bethlehem has had with its much la.ger range of facilities for the production of heavy items. In case of war Youngstown's plants could be converted more quickly to the production of steel products for defense under the direction of the combined Bethlehem-Youngstown organization than they could under the direction of Youngstown alone. The accomplishments of Bethlehem in wartime have been due in large measure to its extensive research organization, which is constantly at work on pure research questions as well as production problems of Bethlehem and of its customers and which would be available in case of another emergency to assist in solving defense production problems of Youngstown's plants.

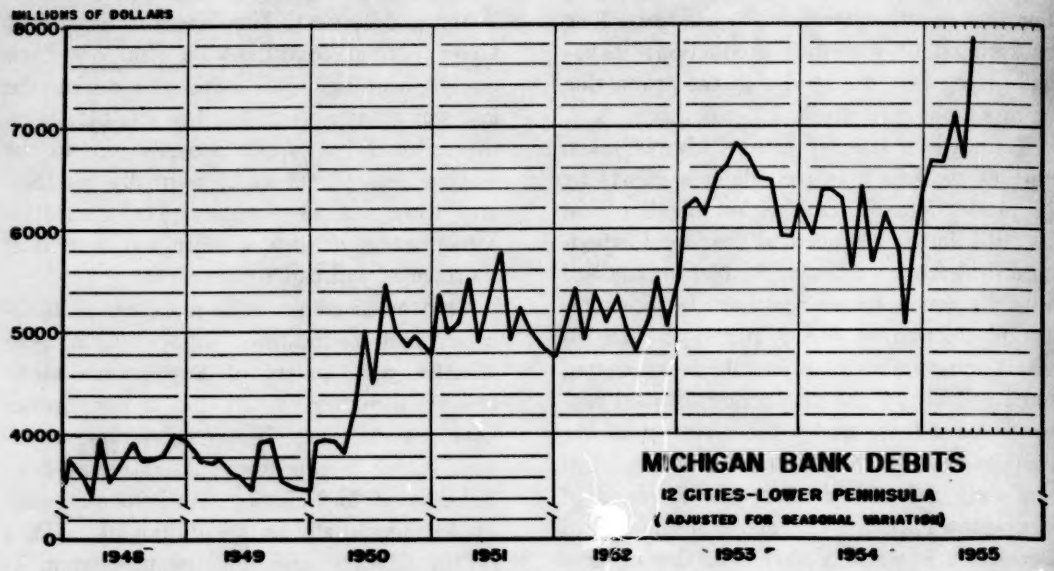
It should be noted that far more than half of the nation's shell forging and finishing capacity is located in the middle western area and that area is now deficient in its capacity to produce shell forging billets and rounds. We also are of the opinion that the entire midwest area has been generally deficient in its capacity to produce other heavy steel products, such as structural shapes, which also are products that would be in short supply in case of any national emergency. It has been stated by Standard and Poors that this area "consumes about one-third of domestic steel production while producing only about one-fourth of it."

It is important that the additional defense steels required in the middle west should be produced in middle west mills. In case of hostilities, steel plants in the east are probably more vulnerable to attack than those located in the middle west. They are also dependent under normal conditions on iron ore from foreign countries. We found out during the last war what a great burden was placed on the railroads to supply domestic ore to the eastern steel plants which normally get their ores from sources overseas. The immediate consequence of such a shift was a critical shortage of railroad rolling stock.

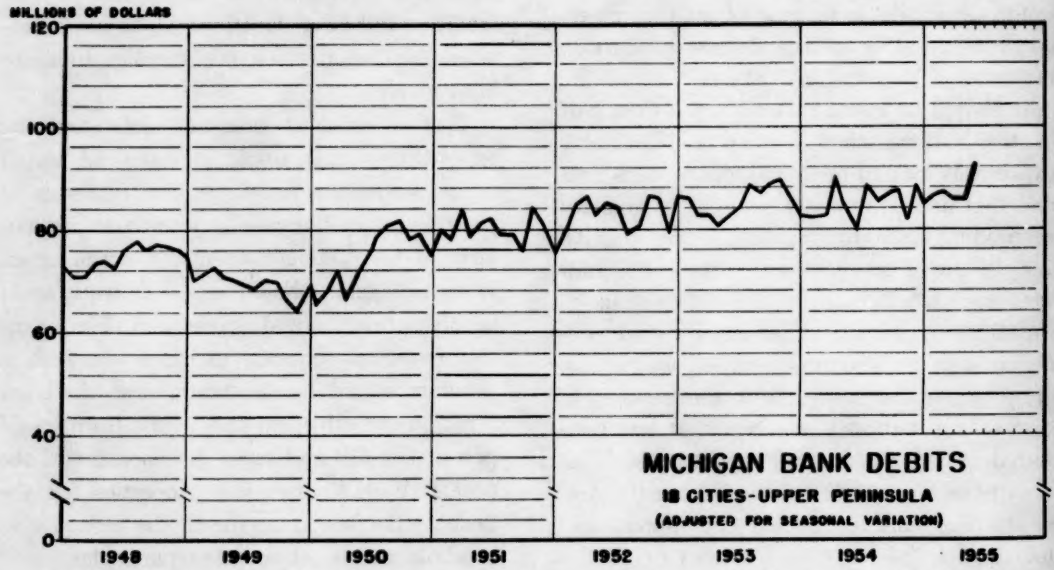
The combined financial resources of Bethlehem and Youngstown will permit a more effective development of Youngstown facilities. As a matter of fact, the two companies have present plans, if merged, for major expansions of Youngstown's facilities at both Youngstown and Chicago. An immediate step would undoubtedly be the addition of facilities in the Chicago area for the production of structural shapes. Also, there are other important products that should have additional production facilities, particularly in the Chicago area. The expansion and installation of new facilities will be at locations which are accessible to adequate iron ore supplies from inland sources.

The construction program alone and the expenditures that would be involved would be of immediate benefit to the economy of the country in the coming years and particularly in the Youngstown and Chicago areas. If an emergency should arise this work could be given priority and accelerated. The financial resources required to carry out such a program would be substantial but the combination of Bethlehem and Youngstown would permit the full and rapid development of the potential of Youngstown properties for the benefit that would accrue to the economy as a whole and steel users in particular.

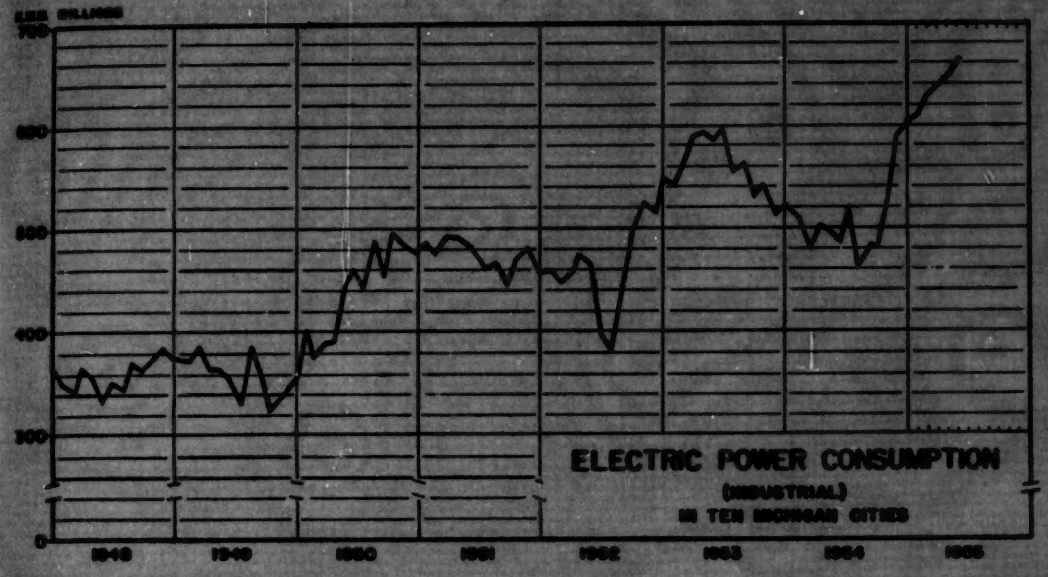
Michigan Business Indicators



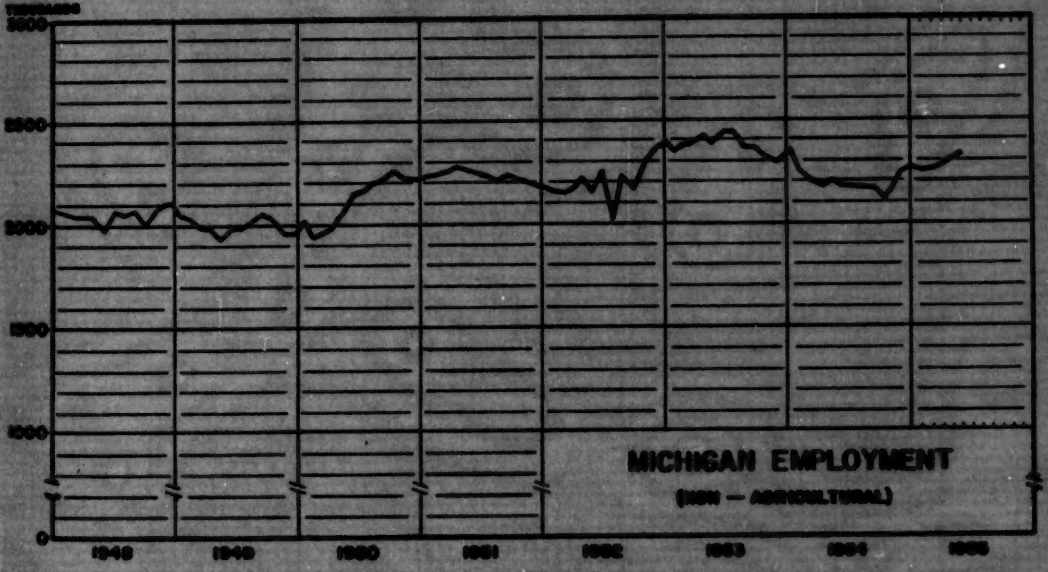
BANK DEBITS—THE MOST INCLUSIVE MEASURE OF BUSINESS ACTIVITY—After a minor decline in April, second-quarter debits pushed to a record high during May as industrial output continued at peak levels.



UPPER PENINSULA BANK DEBITS—In the Upper Peninsula, second-quarter debits moved sharply upward beyond the 1954 peak.



POWER CONSUMPTION—Industrial power consumption moved hand-in-hand with industrial output to rise to a new high in May.



MICHIGAN EMPLOYMENT—Still lagging the 1953 peak, Michigan employment increased slightly to approach the high of 1954.

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MEETING AND BEATING COMPETITION
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"Now that the pressure of a seemingly insatiable consumer demand has somewhat eased, management is under the necessity of turning its attention to the areas of efficiency and economy. The papers published in this volume reflect this return to some of the traditional concerns of management." The roster of speakers included George W. Troost, Vice-President, Chrysler Corporation; Harold F. Smiddy, Vice-President, General Electric Company; Roy C. Ingersoll, President, Borg-Warner Corporation; Richard C. Gerstenberg, Assistant Comptroller, General Motors Corporation. The foreword was written by Herbert F. Taggart, Assistant Dean, School of Business Administration, University of Michigan. These papers should be of great interest and value to those who are charged with meeting the managerial responsibilities of these times.

CONFERENCE ON SALES MANAGEMENT
Contributed Papers, 1954, JAMES G. HAUK, *Editor*

Michigan Business Papers, No. 28
166 pages, paper, $2.00

This volume contains papers and panel discussions presented at the recent Conference on Sales Management. The subjects include new product development, the Robinson-Patman Act, shaping a profitable sales policy, salesmen's compensation, and broadened responsibility of sales management. The roster of speakers includes H. Bruce Palmer, President, The Mutual Benefit Life Insurance Company; Ira G. Needles, President, the B. F. Goodrich Rubber Company of Canada, Ltd.; Willis E. Morgan, Vice-President, Marketing, The Burrough's Corporation; Jesse W. Markham, Acting Director, Bureau of Industrial Economics, Federal Trade Commission; Harry F. Tosdale, Professor of Marketing, Harvard University. Professor D. M. Phelps served as Chairman of the Conference. These papers should be of interest to all who are concerned with the problems of sales management.

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Michigan Business Reports, Number 25
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